April 19, 2004

MEMORANDUM TO: C. William Reamer, Director
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

FROM: Robert M. Latta, Sr. On-Site Licensing Representative **/RA/**
Project Management Section A
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

Jack D. Parrott, Sr. On-Site Licensing Representative **/RA/**
Project Management Section A
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION ON-SITE LICENSING REPRESENTATIVES' REPORT ON THE YUCCA MOUNTAIN PROJECT FOR JANUARY 1, 2004, THROUGH FEBRUARY 29, 2004

The purpose of this memorandum is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (OR) report for the period of January 1, 2004, through February 29, 2004.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The ORs continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTI) and their resolution. During this reporting period, the ORs continued to observe activities associated with Yucca Mountain site activities, KTIs, and audits. The ORs also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

If you have any questions on this report or its attachments, please call Robert Latta, on (702) 794-5048, or Jack Parrott, on (702) 794-5047.

Attachments:
1. U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report, Number OR-03-06 for the Reporting Period of January 1, 2004 Through February 29, 2004
2. Figure 1: ESF/ECRB Plan View Alcove, Niche and Borehole Testing Locations
3. Table 1: Current Test Activities by Scientific Investigation Test Plan
4. Table 2: U.S. NRC On-Site Licensing Representatives' Tracking Report for Open Items

cc: See attached list

Memorandum to C.W. Reamer from R. Latta, Jack Parrott, dated: March 19, 2004
cc:

A. Kalt, Churchill County, NV
R. Massey, Churchill/Lander County, NV
I. Navis, Clark County, NV
E. von Tiesenhausen, Clark County, NV
G. McCorkell, Esmeralda County, NV
L. Fiorenzi, Eureka County, NV
A. Johnson, Eureka County, NV
A. Remus, Inyo County, CA
M. Yarbro, Lander County, NV
S. Hafen, Lincoln County, NV
M. Baughman, Lincoln County, NV
L. Mathias, Mineral County, NV
L. Bradshaw, Nye County, NV
M. Maher, Nye County, NV
D. Hammermeister, Nye County, NV
M. Simon, White Pine County, NV
J. Ray, NV Congressional Delegation
M. Henderson, NV Congressional Delegation
B. J. Gerber, NV Congressional Delegation
F. Roberson, NV Congressional Delegation
T. Story, NV Congressional Delegation
R. Herbert, NV Congressional Delegation
L. Hunsaker, NV Congressional Delegation
S. Joya, NV Congressional Delegation
K. Kirkeby, NV Congressional Delegation
K. Finfrock, NV Congressional Delegation
R. Loux, State of NV
S. Frishman, State of NV
S. Lynch, State of NV
P. Guinan, Legislative Counsel Bureau
J. Pegues, City of Las Vegas, NV
M. Murphy, Nye County, NV
M. Corradini, NWTRB
J. Treichel, Nuclear Waste Task Force
K. Tilges, Shundahai Network
M. Chu, DOE/Washington, D.C.
G. Runkle, DOE/Washington, D.C.
C. Einberg, DOE/Washington, D.C.
S. Gomberg, DOE/Washington, D.C.
W. J. Arthur, III , DOE/ORD
R. Dyer, DOE/ORD
J. Ziegler, DOE/ORD
A. Gil, DOE/ORD
W. Boyle, DOE/ORD
D. Brown, DOE/OCRWM
S. Mellington, DOE/ORD
C. Hanlon, DOE/ORD
T. Gunter, DOE/ORD
A. Benson, DOE/PR
N. Hunemuller, DOE/ORD
M. Mason, BSC
S. Cereghino, BSC
N. Williams, BSC
E. Mueller, BSC/PR
J. Mitchell, BSC
M. Voegele, BSC/SAIC
D. Beckman, BSC/B&A
B. Helmer, Timbisha Shoshone Tribe
R. Boland, Timbisha Shoshone Tribe
R. Arnold, Pahrump Paiute Tribe

cc: (Continued)

J. Birchim, Yomba Shoshone Tribe
R. Holden, NCAI,
R. Clark, EPA
R. Anderson, NEI
R. McCullum, NEI
S. Kraft, NEI
J. Kessler, EPRI
D. Duncan, USGS
R. Craig, USGS
W. Booth, Engineering Svcs, LTD
L. Lehman, T-REG, Inc.
S. Echols, ECG
C. Marden
J. Bacoch, Big Pine Paiute Tribe of the Owens Valley
T. Kingham, GAO
D. Feehan, GAO
E. Hiruo, Platts Nuclear Publications
G. Hernandez, Las Vegas Paiute Tribe
P. Johnson, Citizen Alert
G. Hudlow
A. Elzeftawy, Las Vegas Paiute Tribe
R. Huey, BSC
R. Hasson, NQS
M. Van Der Puy, DOE
A. Capoferri, DOE

W. Briggs, Ross, Dixon & Bell
C. Meyers, Maopa Paiute Indian Tribe
R. Wilder, Fort Independence Indian Tribe
D. Vega, Bishop Paiute Indian Tribe
J. Egan, Egan, Fitzpatrick & Malsch
J. Leeds, Las Vegas Indian Center
J.C. Saulque, Benton Paiute Indian Tribe
C. Bradley, Kaibab Band of Southern Paiutes
R. Joseph, Lone Pine Paiute-Shoshone Tribe
L. Tom, Paiute Indian Tribes of Utah
E. Smith, Chemehuevi Indian Tribe
D. Buckner, Ely Shoshone Tribe
D. Eddy, Jr., Colorado River Indian Tribes
V. Guzman, Inter-Tribal Council of NV (Chairwoman, Walker River Paiute Tribe)
H. Jackson, Public Citizen
J. Wells, Western Shoshone National Council
P. Thompson, Duckwater Shoshone Tribe
D. Crawford, Inter-Tribal Council of NV
I. Zabarte, Western Shoshone National Council
E. Opelski, NQS
J. Bess, Bechtel/SAIC
S. Devlin
Hunton & Williams
J. Williams, DOE

March 19, 2004

MEMORANDUM TO: C. William Reamer, Director
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

FROM: Robert M. Latta, Sr. On-Site Licensing Representative **/RA/**
Project Management Section A
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

Jack D. Parrott, Sr. On-Site Licensing Representative **/RA/**
Project Management Section A
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION ON-SITE LICENSING REPRESENTATIVES' REPORT ON THE YUCCA MOUNTAIN PROJECT FOR JANUARY 1, 2004, THROUGH FEBRUARY 29, 2004

The purpose of this memorandum is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (OR) report for the period of January 1, 2004, through February 29, 2004.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The ORs continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTI) and their resolution. During this reporting period, the ORs continued to observe activities associated with Yucca Mountain site activities, KTIs, and audits. The ORs also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

If you have any questions on this report or its attachments, please call Robert Latta, on (702) 794-5048, or Jack Parrott, on (702) 794-5047.

Attachments:
1. U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report, Number OR-03-06 for the Reporting Period of January 1, 2004 Through February 29, 2004
2. Figure 1: ESF/ECRB Plan View Alcove, Niche and Borehole Testing Locations
3. Table 1: Current Test Activities by Scientific Investigation Test Plan
4. Table 2: U.S. NRC On-Site Licensing Representatives' Tracking Report for Open Items

cc: See attached list
DISTRIBUTION: See attached page
S:\HLWRS\Staff Docs\RML1\25JANFEB2004 ORReport.wpd **ML040910380**

OFC	HLWRS	HLWRS	HLWRS	HLWRS	OGC	HLWRS
NAME	RLatta	JParrott	LCampbell	FBrown*	JMoore*	CWReamer*
DATE	04/01/04	04/01/04	04/12/04	04/19/04	04/21/04	04/23/04

Distribution: Memorandum to C.W. Reamer from R. Latta, J. Parrott dated: March 19, 2004

DISTRIBUTION:

File Center	PUBLIC	ACNW	CNWRA	NMSS r/f	HLWRS r/f	LSN
LKokajko	ECollins	LCampbell	LChandler	KStablein	ACampbell	MYoung
JMoore	MBailey	FBrown	MZobler	BSpitzberg	WMaier	GMorell
TCombs	MWoods	DHiggs	SRohrer	KMcConnell	EO'Donnell	MVirgilio
HArlt	RNataraja	WPatrick	JBradbury	RJohnson	TMcCartin	JTrapp
KChang	MFederline	TCarter	TMatula	GHatchett		

U.S. NUCLEAR REGULATORY COMMISSION

ON-SITE LICENSING REPRESENTATIVES' REPORT

NUMBER OR-04-01

FOR THE REPORTING PERIOD OF JANUARY 1, 2004 THROUGH FEBRUARY 29, 2004

/RA/

Robert M. Latta
Sr. On-Site Licensing Representative
Project Management, Section A
Project Management & Engineering
Division of High-Level Waste
Repository Safety
Office of Nuclear Material Safety
and Safeguards

/RA/

Jack D. Parrott
Sr. On-Site Licensing Representative
Project Management, Section A
Project Management & Engineering
Division of High-Level Waste
Repository Safety
Office of Nuclear Material Safety
and Safeguards

Reviewed and Approved By: **/RA/**
Frederick D. Brown
Section Chief
Project Management Section A
Project Management & Engineering
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

TABLE OF CONTENTS

U.S. NUCLEAR REGULATORY COMMISSION
ON-SITE LICENSING REPRESENTATIVES' REPORT
NUMBER OR-04-01

PAGE

ACRONYMS AND ABBREVIATIONS

ACRO	TITLE
AECL	Atomic Energy of Canada, Limited
AMR	Analysis Modeling Report
AOI	Audit Observation Inquiry
AP	Administrative Procedure
BBWI	Bechtel, Babcock & Wilcox, Inc.
BSC	Bechtel SAIC Company, LLC
CAP	Corrective Action Program
CAR	Corrective Action Report
CAQ	Conditions Adverse to Quality
CNWRA	Center for Nuclear Waste Regulatory Analysis
CR	Condition Report
DOE	U.S. Department Of Energy
DR	Deficiency Report
ECRB	Enhanced Characterization of the Repository Block
ESF	Exploratory Studies Facility
EWDP	Early Warning Drilling Program
GET	General Employee Training
ICP	Inter-Contractual Purchase
INEEL	Idaho National Engineering and Environmental Laboratory
INPO	Institute of Nuclear Power Operations
KTI	Key Technical Issue
LA	License Application
MII	Management Improvement Initiative
MOR	Monthly Operating Review

ACRONYMS AND ABBREVIATIONS - continued -

ACRO	TITLE
NCR	Nonconformance Report
NRC	U.S. Nuclear Regulatory Commission
NWTRB	Nuclear Waste Technical Review Board
OCRWM	Office of Civilian Radioactive Waste Management
OR	On-Site Representative
ORD	Office of Repository Development
OQA	Office of Quality Assurance
PWR	Pressurized Water Reactor
QA	Quality Assurance
QAR	Quality Assurance Reviewer
QARD	Quality Assurance Requirements Description
QER	Quality Engineering Representatives
QSL	Qualified Supplier List
RCA	Root Cause Analysis
SS	Stainless Steel
SSC	Structure, System, or Component
TDMS	Technical Data Management System
TMA	Task Management Agreement
TSA	Technical Services Agreement
TSPA	Total System Performance Assessment
UCCSN	University and Community College System of Nevada
USGS	U.S. Geological Survey
VoEE	Verification of Educational Experience
WPCS	Waste Package Closure System
YMP	Yucca Mountain Project

EXECUTIVE SUMMARY

GENERAL SITE ISSUES

During this reporting period, the Yucca Mountain Project (YMP) worked to establish a current silica dust personnel exposure baseline for routine work activities in the underground. The YMP also performed monitoring to update the silica dust data set for normal operations. Also, the YMP worked to establish two new seismic stations in the underground.

GROUND SUPPORT SYSTEM

An OR Open Item has been initiated to track the resolution of an issue in the safety analysis of the ground support system in the Exploratory Studies Facility (ESF). The ground support system was at one time expected to be classified as "important to safety" under the safety analysis requirements of 10 CFR Part 63. Subsequent analysis, that has not yet been finalized in accordance with YMP procedures, indicates that the ground support system will not be classified as "important to safety." Should the ground support system ultimately be found "important to safety," significant effort would likely be required to justify the use of some installed ground support equipment, or replace that equipment if its use could not be justified. The On-Site Representitives (ORs) identified this issue as **OR Open Item 04-01**.

EXPLORATORY STUDIES FACILITY TESTING

The drift-scale thermal test in the ESF continued its cool-down phase. Monitoring of the thermal test alcove and boreholes in the access observation drift and moisture monitoring in Alcove 7 continues. Current plans call for an Alcove 7 reentry, equipment maintenance, observation, and possible sample collection, in the August/September 2004 time frame.

ENHANCED CHARACTERIZATION OF REPOSITORY BLOCK TESTING

The YMP has completed all near term entries beyond the Enhanced Characterization of Repository Block Testing (ECRB) bulkheads at Stations 17+63, 22+01, 25+03, and 25+99. These bulkheads have been sealed and monitoring of test equipment has begun. Current plans call for a reentry, for equipment maintenance, observation, and possible sample collection, in the August/September 2004 time frame. Also, preparations were made to begin tracer studies in the large plot test in Alcove 8.

SURFACE-BASED FIELD TESTING

The YMP began an aeromagnetic survey around the Yucca Mountain area the week of February 16, 2004. The work was stopped on February 21, 2004, when the fuselage of the aeromagnetic survey instrument package was damaged, after sideswiping a rock outcrop. The locations of magnetic anomalies, to be drilled and sampled as part of the investigation of igneous intrusion probability, are being evaluated. Continued water well drilling in Inyo County, California, has been put on hold until spring 2004. No Nye County Early Warning Drilling YMP (EWDP) work took place during this reporting period; however, water level measurements were taken, and tests conducted in Nevada Test Site, Area 25, wells J-12 and J-13.

LABORATORY STUDIES

Preliminary corrosion testing has identified potential corrosion concerns with the borated stainless steel absorber plate material used in the lattice assembly for the waste package.

The thermal management dispersion test at the Atlas facility has been deferred pending additional pretest predictions.

CONTROL OF SOFTWARE YET TO BE QUALIFIED

As previously documented in Report OR-03-04, dated October 20, 2003, an OR concern was identified relative to the use of the output of unqualified software as direct input in other technical products. During this reporting period, the ORs observed the conduct of DOE's Office of Quality Assurance (OQA) Surveillance OQA-SI-04-008, "Use and Control of Software Yet to be Qualified." The scope of this surveillance involved the evaluation of unqualified software in obtaining preliminary feeds to downstream technical products, such as Analysis Modeling Reports (AMRs) and complex software modeling codes.

The ORs concluded that the audit team effectively evaluated the use of software under development to provide preliminary feeds to downstream technical products. The audit team identified inconsistency in the process for tracking the use of preliminary information from unqualified software, but did not identify any cases where the use of preliminary information was not adequately identified.

BSC SURVEILLANCE OF ANALYSIS REPORTS

During this reporting period BSC QA completed their compliance based surveillance of Analysis Reports. The purpose of this surveillance was to evaluate implementation of the development of scientific analysis in products supporting the License Application (LA).

The surveillance team concluded that although the procedural processes were regarded as adequate, implementation of the procedural requirements was determined to be inadequate. The surveillance team also indicated that the documented errors in the analysis reports should have been identified and corrected by the originator or checker (independent reviewer).

CAR-001 (MODEL VALIDATION) AND CAR-002 (SOFTWARE) STATUS UPDATE

DOE OCRWM issued Corrective Action Report (CAR) BSC-01-C-001 (CAR-001) concerning model validation on May 3, 2001, and CAR BSC-01-C-002 (CAR-002) related to software deficiencies on June 12, 2001. Specifically, CAR-001 was issued because DOE OQA had identified systemic examples of inadequate model validation during an audit. CAR-002 was issued to document multiple examples of a failure to implement the QA program requirements related to software development and use.

During this reporting period, the ORs reviewed the status of CAR-001 (currently tracked as CR-099) and CAR-002 (currently tracked as CR-102), both of which remain open. Based on the results of this review, the ORs determined that OQA's Quality Assurance reviewer and the respective team members for each of these CARs had developed an extensive verification package to objectively demonstrate the results of their verification activities. The ORs reviewed the comprehensive resolution plan and verification checklist related to each commitment for these CARs, and confirmed that appropriate measures had been implemented to track each commitment through closure. The ORs will continue to monitor the resolution of the issues identified in these CARs and document the results in a future report.

EVALUATION OF CURRENT TREND INFORMATION

The YMPs "Trend Evaluation Report" for the first quarter fiscal year (FY) 2004, was released on February 13, 2004. This report is an integral part of the CAP and is used to identify patterns

and the causes of CRs, such that management can proactively identify effective resolutions. Based on the analysis of the information contained in this report, three major contributors to the causes of CRs were identified. These contributors involved human performance errors (38%), communications issues (19%), and management problems (14%). Within the human performance category, most of the errors were attributed to either skill (49%) or rule (45%) based errors.

The Trend Evaluation Report also indicated that many of the problems are related to human performance errors. However, the associated corrective actions appear to focus on procedure changes. The report further states that, "Management attention is needed to ensure that human performance is monitored and individual accountability maintained such that these problems do not rise to the level of needing additional corrective action."

As stated in the Executive Summary of the Trend Evaluation Report, "The problems noted in this report for human performance are similar to those identified in the previous trend evaluation report and a condition report (CR-1497) was written to address these problems." These actions include the implementation of an event/error prevention framework based on Institute of Nuclear Power Operations (INPO) and commercial practices to address human performance errors in procedure implementation. The ORs will continue to monitor the YMP's human performance improvement initiatives, and the results will be documented in a future report.

MONTHLY OPERATING REVIEW

During this reporting period, the ORs attended the DOE Monthly Operating Review (MOR) meetings. These meetings included discussions concerning YMP activities, management initiatives, QA program issues, licensing, environmental safety and health, site operations, public affairs, and business administration issues for the DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involve a summary of major issues, major accomplishments, performance indicators for work execution, YMP support, and YMP management. The increased focus and attention on improving performance and enhanced management processes represents an overall improvement in YMP controls. The performance indicators for the YMP, as given in the MOR, are still maturing, therefore, their utility for indicating the performance is not yet known. Also, some areas of performance have not yet developed sufficient metrics or data to indicate performance.

REPORT DETAILS

INTRODUCTION

The principal purpose of the On-Site Representatives' (ORs) report is to inform U.S. Nuclear Regulatory Commission (NRC) managers, staff, and contractors of information on the U.S. Department of Energy (DOE) programs in repository design, performance assessment, performance confirmation, and environmental studies that may be useful in fulfilling NRC's role during prelicensing consultation. The primary focus of this and future OR reports will be on DOE's programs for subsurface and surface-based testing, performance assessment, data management systems, environmental studies, and quality assurance (QA). Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to support preparation of the License Application (LA). The ORs also take part in activities associated with resolving NRC Key Technical Issues (KTIs). This report covers the period of January 1, 2004, through February 29, 2004.

OBJECTIVES

The OR's mission is to serve principally as a point of prompt information exchange and to identify preliminary concerns with site investigations and potential licensing issues. The ORs carry out this role by gathering and evaluating information, identifying concerns, and raising more significant issues to NRC management's attention. Communication with DOE is accomplished by exchanging information on data, plans, schedules, documents, activities and pending actions, and resolution of issues. The ORs interact with DOE scientists, engineers, and managers, with input from NRC Headquarters management, regarding the implementation of NRC policies, programs, and regulations. The ORs also focus on such issues as, design controls, data management systems, performance assessment, and KTI resolution. A primary OR role is to identify areas in site studies, activities, or procedures that may be of interest or concern to the NRC staff.

1 FIELD AND LABORATORY TESTING

1.1 General Issues

Silica Dust Exposure Data Set and Baseline

During this reporting period, the Yucca Mountain Project (YMP) worked to establish a current silica dust personnel exposure baseline for routine work activities in the underground. The YMP also performed monitoring to update the silica dust data set for normal operations. Upon completion of the additional monitoring, Bechtel SAIC Company, LLC (BSC) will evaluate and propose to DOE the merits of routine monitoring to confirm the adequacy of the Silica Protection Program. Until such time as the YMP has validated the existing monitoring policies and programs, only qualified workers are authorized to enter the underground. Furthermore, pending BSC's confirmation of the data, tours and other underground visits will be limited to those that have underground access training, and medical certification. It is anticipated that this process will take several weeks.

Establishment of New Seismic Stations

During this reporting period, the YMP, in conjunction with the University of Nevada-Reno, began work to establish two new seismic stations in the underground. These new locations are in Niche 5, and near Station 69+46 in the south ramp.

Upon completion of this work, there will be three seismic stations in the subsurface at Yucca Mountain (the two new ones and an existing seismic station at Alcove 5.

1.2 Ground Support System

In August 2003, a Corrective Action Report (CAR)-200 (now Condition Report (CR)-80) documented as a significant condition adverse to quality that non-conforming conditions with the ground support system in the Exploratory Studies Facility (ESF) were not documented, tracked, or dispositioned with nonconformance reports as required by the YMP's Quality Assurance Requirements and Description document. The ground support system at the Yucca Mountain ESF consists of rock-bolts, wire mesh, and steel sets used to stabilize the sub-surface rock mass.

Also, in August 2003, CAR-199 (now CR-77) documented as a significant condition adverse to quality, that DOE's Office of Civilian Radioactive Waste Management (OCRWM) procedure AP-3.12Q, "Design Calculations and Analyses," was not followed during the development of an analysis that recommended the indefinite deferral of ESF ground support completion. The issue, as stated in the CR, is that although the ground support was identified as a system important to waste isolation and test interference, it was not constructed as a quality affecting (or "Q") structure, system, or component (SSC) in all areas. The concern identified in the CR is that since the analysis that recommended indefinite deferral of ESF ground support completion was not developed in accordance with Administrative Procedure (AP)-3.12Q, it cannot be used as an analysis for the "Q" ground support system. The CR also identifies that this "non-Q" analysis reversed the recommendation of an earlier "Q" analysis, which did follow procedure AP-3.12Q.

Another significant condition adverse to quality (now designated as a "level-A" condition report) was written in November 2003 (CR-1221). This CR documented the use of the analysis described in CR-77 to modify the list of SSCs important to safety or waste isolation (Q-list) to remove the ESF ground support system. This analysis was marked "Preliminary," and AP-3.12Q provides that preliminary analyses shall not be used to support design drawings and specifications for fabrication, procurement, and construction. In addition, this analysis formed the basis for changing the Q-list, which will directly affect the design drawings, specifications, procurement, and construction of remaining ESF ground support items. Therefore, this CR, as originally written by the initiator, recommended issuance of a stop work order.

Should the ground support system ultimately be found "important to safety," significant effort would likely be required to justify the use of some installed ground support equipment, or replace that equipment if its use could not be justified. The analysis used to reach an ultimate conclusion should be prepared in accordance with the program's quality assurance requirements. Therefore, this item is identified as **OR Open Item 04-01**, pending a review of the final analysis for the issue.

1.3 Scientific Investigations

DOE continues to conduct scientific and engineering investigations, or tests, to understand Yucca Mountain's geology, chemistry, hydrology, and other physical aspects and processes that could affect a potential repository's safety, and to provide input to a potential repository's design. DOE uses the results of this work to help form a safety and licensing basis for a potential repository. Most of DOE's active scientific and engineering investigations are being done through its contracts with the national laboratories and the U.S. Geological Survey (USGS).

Table 1 provides a list of these currently active, or recently completed tests. Included in the list is the reference number of the plan for, and status of, each test at the end of the reporting period. Also, DOE supports some scientific investigations through funding of YMP oversight to Nye County, Nevada and Inyo County, California. Under this program, these counties conduct independent scientific investigation programs. These are described under Section 1.6, "Surface Based Field Testing".

In addition, the University and Community College System of Nevada (UCCSN) has a cooperative agreement with DOE's Office of Repository Development (ORD) to participate in scientific and engineering studies of the Yucca Mountain repository site. A listing of all current and closed UCCSN scientific investigations can be found at: http://hrcweb.nevada.edu/qa/sip.htm.

Furthermore, DOE contracts with Atomic Energy of Canada, Limited (AECL) for scientific investigation of potential repository issues. AECL is currently working on two studies under the DOE QA program. They are: (1) crevice corrosion in titanium, Alloy 22, and stainless steel; and (2) neutron diffraction based measurements of strain in Alloy 22 test specimens.

The status of selected YMP tests is described below.

1.4 Exploratory Studies Facility Testing (ESF)

The excavation of the ESF testing main drift, completed in 1997, allows the collection of scientific and engineering data at Yucca Mountain. DOE continues testing in the ESF main drift to supply data to support DOE's ongoing scientific studies. Figure 1 shows the ESF test locations. Ongoing ESF testing activities are summarized below.

Alcove 5 Drift-Scale Test

Power to the heated drift was turned off in mid-January 2002, and the 4-year cool-down of the facility is being monitored in accordance with the established DOE test plan. At turnoff, the surface temperature of Canister 1, and the temperature of the rock, were both 201.1° C (394° F). As of the end of this reporting period, the surface temperature of Canister 1 was 70.6° C (159° F), and the temperature of the rock was 72.2° C (162° F). During this test, DOE is performing periodic visual and video inspection, water sampling, gas sampling, neutron logging, and electrical-resistance tomography.

Alcove 7 Moisture Monitoring

Alcove 7 penetrates the Topopah Middle Non-Lithophysal unit for 168 meters from its entrance to the Ghost Dance Fault. Beyond that, it penetrates the Topopah Spring Lower Lithophysal unit. Bulkheads were constructed in the alcove in 1997 to conduct a moisture monitoring test. The test involves continuous in-situ passive measurements of hydrologic conditions in the rock and alcove atmosphere as well as qualitative seepage detection behind the bulkheads. The alcove bulkheads were closed for the first time in December 1997. The bulkheads were last opened on May 20, 2003. During this opening, drops of moisture were observed on the utility lines, and the rock in the crown of the alcove had a moist appearance. The bulkheads were closed again on June 26, 2003. Current plans call for reentry, equipment maintenance, observation, and possible sample collection in the August/September 2004 time frame.

1.5 Enhanced Characterization of the Repository Block Testing

The excavation of the Enhanced Characterization of the Repository Block (ECRB) cross drift, completed in October 1998, allows the collection of scientific and engineering data in stratigraphic units that constitute the bulk of the potential repository horizon. DOE

continues ECRB testing to supply data to support DOE's ongoing scientific studies. Figure 1 describes the ECRB test locations. ECRB testing activities are summarized below.

ECRB Cross-Drift Moisture Monitoring

In an ongoing effort to monitor moisture conditions in the sealed portions of the ECRB, the bulkheads from Station 22+01 and beyond were closed on November 14, 2001. The bulkhead at Station 17+63 was closed on December 20, 2001. Before the closure of those bulkheads, YMP personnel installed enhanced monitoring and collection equipment, including remote cameras and moisture-collection devices, in accordance with the revised test plan. Plastic sheets and drip cloths infused with pH-sensitive chemicals were installed near the crown of the tunnel, and numerous sample bottles were placed to collect possible drips from rock bolts. Various entries for observation, equipment replacement or removal, and sample collection have occurred since this initial closure.

The last ventilated entry into the ECRB began on September 8, 2003, to install batteries for the remaining instruments (cameras) and to remove unused equipment. This activity concluded in November 2003 and all bulkheads, up to the bulkhead at Station 17+63, were sealed for an indefinite period of time. All external power has been shut off past Station 17+63, and the batteries installed should last in excess of one year. During this reporting period, the equipment for taking gas samples behind the bulkhead at Station 17+63 became operational. Current plans call for a reentry, for equipment maintenance, observation, and possible sample collection, in the August/September 2004 time frame.

Alcove 8 (Large Plot Test)

The Large-Plot Test is an infiltration test that uses a metal box, sectioned into 12 compartments, that is placed on the bare rock floor of Alcove 8, behind a bulkhead. Water is placed into the compartments. This water seeps through approximately 20 m (65.6 ft) of the upper lithophysal zone and the middle nonlithophysal zone, of the Topopah Spring Tuff, and is collected in Niche 3 of the ESF.

The Large-Plot Test started on August 20, 2002, with two of the compartments. On August 28, 2003, testing was expanded from 2 to 12 compartments by filling all 12 with water to re-establish flow in each of the 12 infiltration zones. During this reporting period, monitoring of Niche 3 for observed seepage continued, and preparations were made for tracer application that is now scheduled for March 2004.

1.6 Surface-Based Field Testing

Investigation of Magnetic Anomalies in the Yucca Mountain Region

As part of the ongoing investigation of magnetic anomalies in the Yucca Mountain region the YMP began conducting an aeromagnetic survey around the Yucca Mountain area the week of February 16, 2004. The survey involves flying a aeromagnetic survey instrument, approximately 30 meters off the ground, towed by a helicopter along parallel flight paths across the survey area. The purpose of this work is to look for geomagnetic anomalies below the ground surface that could be related to past igneous activity. The area to be covered is about 345 mi^2 (893 km^2), or roughly a square shaped area about 20 miles on a side with the Yucca Mountain site in the north central part of that area.

The work was proceeding with no identified issues until February 21, 2004, when the fuselage of the aeromagnetic survey instrument package was damaged after sideswiping a rock outcrop on a ridge west of Busted Butte (about 5 miles south of the north portal of Yucca Mountain). The survey instrument was shipped out of state where it is to be installed in a new fuselage. The survey had not resumed as of the end of this reporting period. Before the survey can resume, the YMP will conduct an investigation on how this accident happened and will determine and initiate corrective actions to prevent recurrence.

The locations for igneous anomalies, to be drilled in the Crater Flat/Amargosa Valley area as part of this investigation, are being evaluated in an environmental assessment of the proposed work and may need to be reevaluated pending results of the aeromagnetic survey.

Nevada Test Site (Area 25) Wells

During this reporting period, water level measurement were taken in Wells J-12 and J-13 by the U.S. Geological Survey. The measurement period lasted about 2 weeks and included pump-down tests.

Nye County Early Warning Drilling Program

The Early Warning Drilling Program (EWDP) was initiated as part of the Nye County, Nuclear Waste Repository YMP Office, Yucca Mountain Oversight program. The purpose of the EWDP is to establish a groundwater monitoring system to protect the residents of Nye County, in Amargosa and Pahrump Valleys, against potential radionuclide contamination.

The program is also intended to provide geologic and hydrologic information to DOE's Yucca Mountain program. The targeted area is located in the hydrogeologic system south of Yucca Mountain. The questions planned to be investigated are: (1) the origin of spring deposits; (2) the geology and hydraulic properties of valley-floor sediments; (3) the recharge; and (4) groundwater-flow patterns.

EWDP Phase IV Status

New Wells EWDP-16P, EWDP-27P, EWDP-28P, EWDP-24P, and EWDP-29P were drilled and completed in 2003 as part of Phase IV. Detailed information on these wells (when available) can be found at: http://www.nyecounty.com/ewdpmain.htm.

EWDP Phase V Status

EWDP Phase V began in December 2003, with drilling at well location 19PB in December 2003. The drilling of this well was done to demonstrate a sonic coring technique. After rotary drilling and installation of casing to a depth of 107 m (350 ft), a sonic core was taken to a depth of 198 m (650 ft) and the well was completed. Sonic coring provides a continuous core of unconsolidated sediments in such a way as to potentially allow the identification of preferential flow pathways and to provide small scale estimates of flow and transport properties. The demonstration was completed successfully and the core is being processed and stored at the DOE Sample Management Facility.

Inyo County Well Drilling

In early April 2003, Inyo County, California, began drilling the first of five deep monitoring wells in the county, as part of its Yucca Mountain oversight program. This undertaking is titled the "Inyo County Death Valley Lower Carbonate Aquifer Monitoring Program." The county's rationale for drilling these new wells is to: (1) evaluate regional groundwater flow through the southern Funeral Mountains; (2) establish structural controls on flow paths and discharge areas; and (3) evaluate potential zones of mixing between the deep regional groundwater systems and the local shallow groundwater systems to the northeast. The first of these new wells (Travertine #2) was drilled to a depth of 409 m (1341 ft). The well has been completed and pump tested, and the USGS collected water samples. This well is located south of Yucca Mountain, in Death Valley National Park. Drilling of the next well in Inyo County is now expected to begin in spring 2004 at a site near Furnace Creek, also in Death Valley National Park.

1.7 Laboratory Studies

Corrosion Testing

Preliminary testing has identified potential corrosion concerns with the borated stainless steel (SS) absorber plate material used in the lattice assembly for some of the proposed waste packages. Specifically, samples of "Nutronit" (A-978 SS) were pulled from long-term corrosion testing tanks, and based on initial mass values, unanticipated corrosion rates were identified. The current model for waste package performance assumes a corrosion rate similar to that of SS (i.e., 1 - 2.5 times the SS corrosion rate). However, the initial results of the confirmatory tests indicate a significantly higher corrosion rate of 5 - 20 times the SS corrosion rate. Evaluation of the test results are scheduled for completion by the end of March 2004. If the final test results corroborate the initial findings, an impact evaluation will be performed.

Bench Scale Vapor Dispersion Test

The Bench Scale Vapor Dispersion Test installation was scheduled to begin in early November 2003 at the DOE Atlas facility in North Las Vegas. However, the start of this test has been deferred, pending additional pretest predictions, until late FY 2004 or early FY 2005.

2. OUTREACH ACTIVITIES

On January 29, 2004, an OR attended a DOE sponsored meeting of the affected units of government in Las Vegas. One of the main topics of discussion was the DOE's recent announcement of a preferred Nevada rail corridor for the potential transportation of spent nuclear fuel and high-level waste to Yucca Mountain. The OR informed the attendees of the meeting, who might be interested in the regulation of nuclear waste transportation, of the existence of the NRC brochure (NUREG/BR-0292) entitled "Safety of Spent Fuel Transportation."

3 QUALITY ASSURANCE AND ENGINEERING

3.1 Control of Software Yet to be Qualified

As previously documented in Report OR-03-04, dated October 20, 2003, a concern was identified relative to the use of the output of unqualified software as direct input in other technical products. Specifically, Deficiency Report DR-BSC (B)-03-D-170 (currently tracked as CR-17), dated June 30, 2003, identified the use of unqualified software

during the development of Analysis Model Reports (AMRs). The program requirements related to this activity include AP SI.1Q, "Software Management," Section 5.0, which states that: "Software items subject to QARD requirements cannot be used in quality affecting activities prior to the software being base-lined and qualified." Additionally, the Quality Assurance Requirements and Description (QARD), Supplement I, states that software must meet the life cycle requirements set forth in paragraph 1.2.3, and be appropriately base-lined and controlled in accordance with paragraph 1.2.4, prior to being obtained from software configuration management.

Subsequent to the identification of this issue, BSC conducted a surveillance (BQA-SI-03-131) of the preliminary use of unqualified software output. The results of this surveillance did not identify any instances of the use of the output of unqualified software as direct input in other technical products. However, the BSC surveillance team recommended that a follow-up surveillance be performed in the near future to evaluate technical documents issued after the September 1, 2003, closeout date for the surveillance.

During this reporting period, the ORs observed the conduct of DOE's Office of Quality Assurance (OQA) Surveillance OQA-SI-04-008, "Use and Control of Software Yet to be Qualified." The scope of this surveillance involved the evaluation of unqualified software in obtaining preliminary feeds to downstream technical products, such as AMRs and complex software modeling codes. In particular, the surveillance team examined: (1) the population of software currently under development; (2) tracking of preliminary outputs from software under development; (3) configuration management of unqualified software; (4) final checking of output from software used AMRs; and (5) the use of unqualified software outputs in the secondary and tertiary levels of completed technical products.

Based on the OR's observations, the ORs determined that the surveillance team effectively reviewed in-process or recently completed AMRs that used software under development to obtain preliminary feeds. The Surveillance team also conducted detailed interviews of the AMR's originators, checkers, and Quality Engineering Representatives (QERs) in order to obtain an accurate representation of current software implementation practices. These interviews identified several examples where software was qualified in parallel with AMR development, checking, review, and approval. As a result of these interviews, four AMRs that were developed in parallel with the qualification of the software used or developed by the AMR were selected for review by the surveillance team. These AMRs were associated with the characterization of the Ventilation System, Geochemical and Isotopic Constraints, Igneous Intrusion, and Seismic Inputs. The sequences related to the parallel AMR development and the software qualification process were compared to the four selected AMRs to determine which steps were appropriately addressed by the established YMP procedures.

The results of the surveillance team's case comparisons of the process steps for each of the four AMRs revealed that there was an inconsistent approach to the use of software undergoing qualification to produce preliminary feeds to other technical products. Although the AMR originators were cognizant of the need to rerun the software once it was qualified, and to critically compare the results, the surveillance team determined that they were uncertain as to the governing procedure requirements.

As a result of this condition adverse to quality, the surveillance team initiated CR-1804, documenting that no prescribed procedure steps existed for the following required activities:

a. Control preliminary output obtained from unqualified software.
b. Rerun the software once it was qualified.
c. Compare preliminary and final outputs with established acceptance criteria.
d. Document the results and any adverse impacts of the comparison.

Also, OQA's surveillance team noted that procedure AP-SIII.9Q, "Scientific Analysis," and AP-SIII.10Q, "Models," require that where either the analysis or model produces preliminary output that is needed as input, it must be submitted to the Technical Data Management System (TDMS). Furthermore, this step is to occur after the model or analysis has been documented, but before the model or analysis is submitted to checking and review. However, the surveillance team determined that there were inadequate procedural controls related to the use of preliminary output from software that was still under development.

As a result of the surveillance team's review of selected AMRs and interviews with technical product checkers, two additional conditions adverse to quality (CAQ) were identified. These conditions were documented on CR-1805, concerning inadequate procedural controls for determining whether software is suitable for its intended use, and CR-1806, relating to the submission of an AMR to the AP-2.14Q, "Document Reviews" checking process with unqualified software.

Based on the OR's observations of the surveillance teams activities, the ORs determined that planning and preparation for this oversight effort were well developed and that the team effectively evaluated the use of software under development to provide preliminary feeds to downstream technical products. The documented CRs accurately reflected the identified conditions, and the results of the teams findings were appropriately conveyed to the affected organizations during the surveillance closeout meeting. No audit observation inquiries were identified as a result of this surveillance; however, the ORs noted that a deviation from the requirements of the QARD related to the use of unqualified software in quality affecting technical products (see OR Open Item 03-05), remains unresolved. The results of this surveillance and the significance of the associated CRs were discussed at the Quarterly QA Meeting on February 18, 2004.

3.2 BSC Surveillance of Analysis Reports

On February 13, 2004, the ORs attended the management out-brief for BSC QA's compliance based surveillance of Analysis Reports, developed in accordance with procedure AP-SIII.9Q, "Scientific Analysis". The purpose of this surveillance was to evaluate the implementation of the development of scientific analysis in products supporting the LA. Specifically, the surveillance team conducted a compliance based evaluation of products and associated processes to determine the degree to which they meet program requirements in the development of scientific analysis.

Based on the criteria established in the surveillance checklist, the team evaluated a representative sample of approved analysis reports prepared by the Repository Development Organization, including the National Laboratories and subcontractors.

These analyses were related to the following technical products:

a. Environmental Transport Input Parameters Analysis for Biosphere Model
b. Geochemical and Isotopic Constraints on Ground Water
c. Analysis of Infiltration Uncertainty
d. Disruptive Events Features Events and Processes
e. Internal Radionuclide Inventory Analysis
f. Invert Advection vs. Diffusion Analysis
g. Sampling of Stochastic Input Parameters
h. In-Situ Field Testing of Processes

Based on the results of the surveillance team's reviews of these analysis reports, eight Level "B" CRs were initiated (five directly impacted the technical adequacy of the related documents). Subsequent to the identification of these deficiencies, two of the CRs were combined. The resultant seven CRs included deficiencies related to lack of transparency, use of unqualified data, incorrect or incomplete data tracking numbers, incorrect technical work plan and procedure revision references, and failure to update completed analysis reports. As described during the management out-brief, the surveillance team concluded that although the procedural processes were regarded as adequate, implementation of the requirements of AP-SIII.9Q was determined to be inadequate. Also, the surveillance team indicated that the documented errors in the analysis reports should have been identified and corrected during the required AP-SIII.9Q reviews performed by the originator, checker and the AP-2.14, "Review of Technical Products and Data" process.

As a result of the OR's reviews of the documentation related to this surveillance and discussions with the team members, it was determined that this oversight activity was effectively performed. No observation inquiries were identified, and the resultant CRs accurately documented the identified conditions. However, based on the overall conclusion that the implementation of procedural requirements was unsatisfactory, the ORs will continue to monitor the CAP trending program to ensure that these items are appropriately incorporated into the data base.

3.3 CAR-001 (Model Validation) and CAR-002 (Software) Status Update

DOE OCRWM issued Corrective Action Report (CAR) BSC-01-C-001 (CAR-001) concerning model validation on May 3, 2001, and CAR BSC-01-C-002 (CAR-002) related to software deficiencies on June 12, 2001. Specifically, CAR-001 was issued because DOE OQA had identified systemic examples of inadequate model validation during an audit. CAR-002 was issued to document multiple examples of a failure to implement the QA program requirements related to software development and use.

During this reporting period, the ORs reviewed the status of CAR-001 (currently tracked as CR-099) and CAR-002 (currently tracked as CR-102), both of which remain open. Based on the results of this review, the ORs determined that OQA's Quality Assurance Reviewers (QAR) have developed extensive verification packages to objectively demonstrate the results of their verification activities for each CAR. In order to effectively address the issues related to these CARs, a comprehensive plan was developed to identify the process steps related to the verification activities. The ORs reviewed the matrix and verification checklist related to each commitment for these CARs and confirmed that appropriate measures had been implemented to track each commitment through closure. The ORs also noted that, when appropriate, the objective

evidence reviewed by the QAR had been attached to the file that will be submitted to records retention upon completion of the CAR verification activities.

Based on the review of the verification package for CAR-001 (CR-099), the ORs determined that 11 of the 12 actions have been verified as satisfactory by OQA. One action related to evaluation of the effectiveness of AP-SIII.10Q in the area of model validation remains open. Within this area, the QAR determined that improvements have been made as indicated in the previous OQA verification activities for CAR-001 and during a recent OQA performance based audit of AMRs. However, based on OQA's verification efforts in September of 2003, it was determined that BSC failed the verification criteria established in AP-SIII.10Q.

In response to this issue, BSC committed to perform an internal review of the remaining 36 AMRs in development that support the potential LA. Additionally, BSC is performing a self assessment of the AMR development process to evaluate the adequacy of this program, and to determine if any additional actions to preclude recurrence are necessary. BSC also committed to correct the five models found to be unsatisfactory during the OQA CAR verification activities. Subsequent to the completion of these corrective actions, OQA will perform a review of the supplementary commitments made by BSC, and will conduct an extensive evaluation of the remaining 36 models for evaluation of the model evaluation criteria.

Relative to CAR-002 (CR-102), the ORs determined that 25 of the 28 actions have been verified as satisfactorily complete by OQA, with 3 actions remaining with BSC. The remaining actions involve completion of the revisions to procedures AP-SI.1Q, "Software Management," AP-SI.2Q, "Qualification of Level A Software," and AP-SI.3Q "Software Independent Verification and Validation." These revisions, which are nearing completion, will incorporate various aspects of software requirements necessary to meet QARD requirements in the areas of software development, and other issues identified in CRs issued as a result of OQAs recent software audit. Additional actions include the development of training materials necessary for the affected organizations to gain familiarity with the revised procedures.

Following the completion of the remaining corrective actions for CAR-002, OQA plans to examine a selected sample of 25 transition codes processed, or developed subsequent to the latest revision of AP-SI.1Q, "Software Management." Depending on the results of this verification activity, OQA will consider closure of the CAR based on satisfactory results. The ORs will continue to monitor the resolution of the issues identified in these CARs and document the results in a future report.

3.4 Waste Package Prototype

The contract for the first full-scale waste package prototype was awarded to the Joseph Oat Corporation in February 2003. The waste package prototype will be a full-size 21-Pressurized Water Reactor (PWR) configuration with absorber plate. The contract allows for up to 18 months for the completion of fabrication. During this period of time, it is anticipated that BSC QA will provide oversight of the procurement and fabrication activities. Based on the review of the vendor survey documentation, the ORs determined that the waste package prototype is being fabricated by a qualified vendor in accordance with the YMP's QA requirements. The vendor was placed on qualified suppliers list following the completion of two vendor supplier evaluations by BSC QA.

3.5 Evaluation of Current Trend Information

The YMP's "Trend Evaluation Report" for the first quarter FY 2004, was released on February 13, 2004. This report, is an integral part of the CAP and is used to identify patterns and the causes of CRs so that management can pro-actively identify effective resolutions.

Based on the analysis of the information contained in this report, three major contributors to the causes of CRs were identified. These contributors involved: human performance errors (38%); communications issues (19%); and management problems (14%). Within the human performance category, most of the errors were attributed to either skill (49%) or rule (45%) based errors. The Trend Evaluation Report also indicated that many of the problems are related to human performance errors. However, the associated corrective actions appear to focus on procedural changes. The report further states: "Management attention is needed to ensure that human performance is monitored and individual accountability maintained such that these problems do not rise to the level of needing additional corrective action."

The report also states that, "When the human performance related errors are coupled with a reliance on oversight organizations to identify problem areas it is apparent that checking, inspection and auditing processes are being relied upon to obtain quality documentation of our products."

Additionally, the report discusses the comparison of YMP performance to industry data on human performance. As stated in the report, "When compared to OCRWM activities, skill-based errors are a factor of two higher [than the industry]. This indicates the need for YMP self-checking processes based on successful commercial nuclear practices to address this type of error."

As stated in the Executive Summary of the report, "The problems noted in this report for human performance are similar to those identified in the previous trend evaluation report and a condition report (CR-1497) was written to address these problems." These actions include the implementation of an event/error prevention framework based on the Institute of Nuclear Power Operations (INPO) and commercial practices to address human performance errors in procedure implementation.

The information contained in the subject trend report supports the NRC's position, documented in the April 30, 2003, Quarterly QA Meeting Summary, that the YMP needs to demonstrate improvements in its safety culture. Specifically, during this meeting, NRC management stated that recurring problems related to implementation of the QA program have not been appropriately resolved and that ineffective corrective actions have resulted in recurring deficiencies. Therefore, YMP's acknowledgment of the need to resolve the issues documented in CR-1497, is regarded as a positive indication that DOE management has initiated measures to address behavior based problems and accountability issues. The ORs will continue to monitor the YMP's human performance improvement initiatives, and the results will be documented in a future report.

3.6 Technical Evaluation

On January 12-16, 2003, staff from the Division of Waste Management and the Center for Nuclear Waste Regulatory Analyses performed the third aspect of a three-part evaluation of the DOE's YMP Office in Las Vegas, Nevada. During the evaluation activities: (1) staff obtained independent objective evidence regarding the adequacy of

technical information presented in high-risk significant AMRs; (2) assessed the adequacy of DOE's processes in developing and controlling those AMRs; and (3) evaluated the effectiveness of DOE's corrective action process in eliminating recurring problems. The outcome of this three-part evaluation will assist the NRC staff in evaluating DOE's ability to submit a high-quality, technically adequate LA. A final report discussing the evaluation effort will be issued and made publicly available during the second quarter of 2004.

4.0 GENERAL ACTIVITIES

4.1 Meetings

On January 20-21, 2004, an OR and a staff member from the CNWRA attended a public meeting of the U.S. Nuclear Waste Technical Review Board's panels on the Engineered Barrier System and the Waste Management System in Las Vegas, Nevada. The issues discussed during the first day included updates on YMP status, repository design, the OCRWM science and technology program, and studies by Nye County, Nevada, related to the engineered system. Topics discussed during the second day included an update on DOE's transportation program; preparation of waste shipments; container availability and use; carrier considerations; receipt of waste shipments at a potential repository; previous transportation experience and lessons learned; and State and local government concerns. Public attendees were invited to comment at specific times during the sessions and the interactions were regarded as informative.

On February 3-4, 2004, representatives from the NRC, including the ORs, and DOE conducted a Technical Exchange in Las Vegas, Nevada. During this public meeting, DOE presented an overview of its proposed LA for a geologic repository at Yucca Mountain, Nevada. The Technical Exchange was attended by representatives from DOE, NRC, the State of Nevada, local stakeholders, and interested members of the public. DOE's presentations included: (1) the content of a LA; (2) the content and format of a safety analysis report; (3) the level of detail to be contained in the application; (4) future interactions between DOE and NRC before submitting a LA; (5) future design activities; and (6) potential conditions should repository construction be authorized. Additionally, NRC staff members provided a presentation on the process of risk-informing, a review by NRC staff should DOE submit a LA.

On February 18-19, 2004, representatives from the NRC, including the ORs, met with DOE and BSC personnel during the quarterly Quality Assurance and Management meetings. The purpose of these public meetings was to discuss current issues related to the implementation of DOE's QA program, and to examine the status of the YMP's Key Technical Agreements and technical products supporting the potential LA. The meeting was held at NRC Headquarters in Rockville, Maryland, with video and audio connections to the DOE ORD in Las Vegas, Nevada, and the CNWRA in San Antonio, Texas. Additionally, representatives from the Nuclear Energy Institute, NRC Region IV, Bechtel SAIC Co. LLC, General Accounting Office, State of Nevada, Nevada Nuclear Waste Task Force, Nuclear Waste Technical Review Board, Clark County, and interested members of the public participated.

Monthly Operating Review (MOR)

During this reporting period, the ORs attended two DOE Monthly Operating Review (MOR) meetings. These meetings included discussions concerning YMP activities,

management initiatives, QA program issues, licensing, environmental safety and health, site operations, public affairs, and business administration issues for DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involved a summary of major issues, major accomplishments, performance indicators for work execution, YMP support, and YMP management.

During these meetings, the responsible managers provided the overall status of their respective programs using the standard industry identifiers of red, yellow, green, and blue to characterize overall performance, and white to indicate insufficient data or undeveloped metrics to support a color. The color coding of activities, and the included trend information, appears to be appropriate. These presentations typically involved candid evaluations of problem areas including critical path activities, and critiques of performance that focused on accountability and methods for improvement. This increased focus and attention on improving performance and enhanced management processes, represents an overall improvement in YMP controls and continues to be identified as a management strength related to the YMP.

However, it is the general impression of the ORs that many of the performance indicators for the YMP, as given in the MOR, are still maturing. Therefore, effectiveness for indicating performance is not known at this time. Many areas of performance have not yet developed sufficient metrics or data to indicate performance.

Areas with “red” performance indicators at the end of this reporting period are License Support Network Input, Total System Performance Assessment (TSPA), AMR Production, Data Qualification, Technical Product Compliance, and Corrective Action Management System, that include the “red” subindicators of self-reporting culture, causal analysis and corrective action program development, and timely and effective corrective action reports.

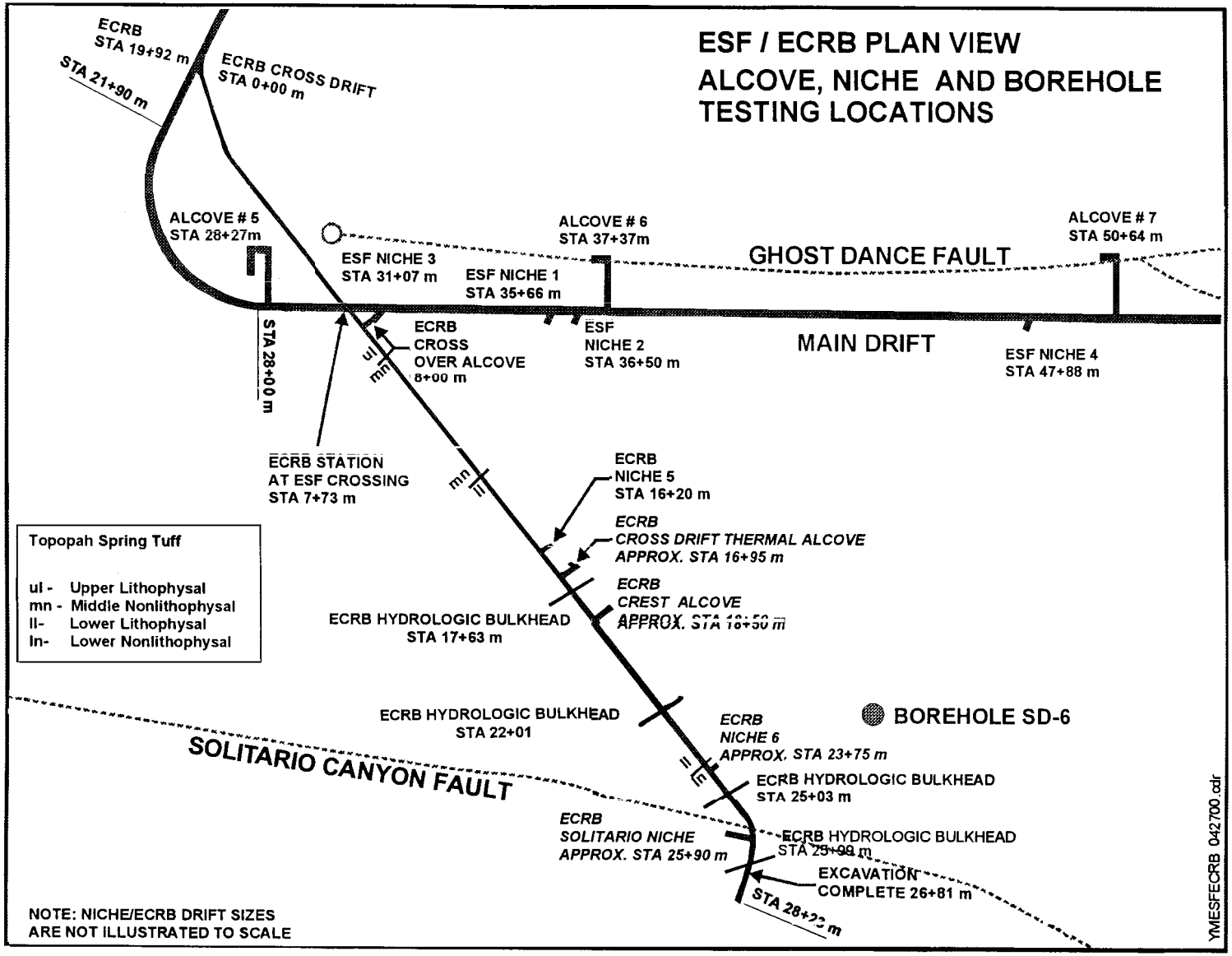
Downward trending indicators (newly yellow from green) are Performance Confirmation and Site Maintenance. A summary of work execution for the YMP, as of the end of this reporting period, indicates that: overall progress towards LA is 57 percent complete; KTI agreement response is 70 percent complete; the LA document is 17 percent complete; Pre-closure safety assessment, is 51 percent complete; TSPA-LA is 78 percent complete; and design is 61 percent complete. The status of the data, codes, and models for LA is: (1) Data - out of a currently estimated 1385 data sets, 739 are qualified, 436 have been submitted for verification, and 210 are under development; (2) Codes - out of a currently estimated total of 371 codes to be used for LA, 130 have been qualified and completed independent verification and validation, 210 are qualified but need retesting (legacy software), and 31 are under development; and (3) Model Reports - out of a total number of 65 model reports that directly support LA, 52 have been completed and 13 are incomplete.

4.2 Site Visits

On February 4, 2004, an OR accompanied a Yucca Mountain tour given by DOE for Jeremie Averous, head of the French Autorite de Surete Nucleaire Sub-directorate for research reactors, dismantling of nuclear installations, contaminated sites, and radioactive waste.

On February 11, 2004, and OR observed a demonstration at the Nevada Test Site of a deep well sampling devise. The demonstration was given by the Desert Research Institute and AEA Technology. The OR also visited with Ed Shyloski, the new BSC

Yucca Mountain Site Manager, and discussed his initial impressions of site safety, site safety culture, and site personnel's access to the Employee Concerns Program and Corrective Action Program.



Attachment 2

CURRENT TEST ACTIVITIES BY SCIENTIFIC INVESTIGATION TEST PLAN

Table 1

Test Plan Title	Test Plan Identifier	Test Plan Status
Ash Redistribution Studies and Field Studies of Lava Morphology & Igneous Processes	SITP-02-DE-001	Test complete
Field Thermal Conductivity Testing	SITP-02-EBS-003	Test ongoing
Atlas Breached Waste Package and Drip Shield Experiments	SITP-02-EBS-005	Testing complete
Laboratory Thermal Conductivity Testing	SITP-02-EBS-006	Testing complete, report in process
Bench Scale Vapor Dispersion Test Plan	SITP-03-EBS-001	Test differed to late FY04, early FY05
Construction Monitoring Equipment Installation and Data Collection	SITP-03-EBS-002	Test ongoing
TSW Fracture and Lithophysal Studies	SITP-02-ISM-001	Test complete
Geologic Mapping of Repository Footprint Southern Expansion and Jet Ridge	SITP-02-ISM-002	Test deferred to 2005
Peña Blanca and Drift Shadow Zone Natural Analog Studies	SITP-02-NA-001	Test ongoing
Rock Modulus Testing	SITP-02-SSD-001	Test complete, report in process
Mechanical Properties Laboratory Investigations	SITP-02-SSD-002	Test ongoing
Ground Support Testing	SITP-02-SSD-003	Test complete
Nye County EWDP Borehole Lithostratigraphy	SITP-02-SZ-001	Test ongoing
Hydrologic/Hydrochemistry Studies in Cooperation with Nye/Inyo County	SITP-02-SZ-002	Test ongoing
Alluvial Testing Complex- Single-well, Multi-well, and Laboratory Studies	SITP-02-SZ-003	Test deferred to FY05
Laboratory Sorption Measurements- SZ	SITP-02-SZ-004	Test complete, data submitted
Moisture Monitoring in the ECRB Bulkhead Cross Drift	SITP-02-UZ-001	Test ongoing
Niche 5 Seepage Testing	SITP-02-UZ-002	Testing complete, SITP to be decontrolled
Alcove 8 Flow & Seepage Testing	SITP superceded by TWP-NBS-HS-000004	Test ongoing
Systematic Hydrologic Testing in the ECRB Cross Drift	SITP-02-UZ-004	Test deferred to 2005
Chlorine-36 Validation	SITP-02-UZ-005	Test complete, report in process
UZ Hydrochemistry Investigation	SITP-02-UZ-007	Test deferred to 2005

Test Plan Title	Test Plan Identifier	Test Plan Status
Fluid Inclusion and Thermal History of Yucca Mountain	SITP-02-UZ-009	Test deferred to 2005
Moisture Monitoring Investigations and Alcove 7 Studies	SITP-02-UZ-010	Test ongoing
Laboratory Sorption Measurements - UZ and SZ	SITP-02-UZ-011	Test deferred to 2005
Drift Scale Test	SITP-02-UZ-012	Test ongoing
Laboratory Flow/Coupled Process Block Experiments	SITP-02-UZ-013	Test deferred to 2005
Microclimate Records in Fracture Minerals	SITP-03-UZ-016	Test deferred
Long-Term Studies of the Degradation and Nuclide Release Commercial Spent Fuel and Fuel Rod Segments	SITP-02-WF-001	Test ongoing
Long-Term Studies of the Degradation and Radionuclide Release from Defense High-Level Waste (DHLW)	SITP-02-WF-002	Test ongoing
Waste Form Colloids Characterization and Concentration Studies	SITP-02-WF-003	Test ongoing
Validation of Dissolved Radionuclide Concentration Limits	SITP-02-WF-004	Test ongoing
Waste Form Dissolution Studies	SITP-02-WF-006	Test ongoing
Waste Form Oxidation Response Tests	SITP-02-WF-007	Test ongoing
Waste Package and Drip Shield Materials Testing	SITP-02-WP-001	Test ongoing
Waste Package Environment Investigations – Dust Geochemistry	SITP-02-WP-008	Test ongoing

U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report

TABLE 2

(For NRC tracking only) AOI-YMSCO-ARC-02-12-01	Identifies the need for DOE OQA to ensure that procedure development and review process includes a documented evaluation to verify compliance with the requirements of the YMP's QARD	OR Report No. OR-03-01	Date Item Closed: **OR Report No.: OR-03-03** **August 15, 2003**
OR Open Item 04-01	A concern regarding the safety analysis of the ground support system in the ESF.	OR Report No.: OR-04-01	Date Item Closed:
OR Open Item 03-06	Based on review of CR-756, 12 quality affecting procedures were approved without meeting the applicable QARD requirements	OR Report No.: OR-03-05	Date Item Closed:
OR Open Item 03-05	The continued use of unqualified software in quality affecting technical products appears to be in conflict with the governing requirements of the implementing procedures and the QARD. **NOT CLOSED**	OR Report No.: OR-03-04	Date Item Closed:
OR Open Item 03-04	With a tentative date of mid June to evaluate CAR BSC(B)-03-(C)-107, the RCD has not timely performed action to this CAR, it has remained open for four months without resolution.	OR Report OR-03-03	Date Item Closed: **OR Report No.: OR-03-05** **January 12, 2004**
OR Open Item 03-03	An evaluation in DOE's progress in implementing corrective actions associated with CAR BSC-01-C-001, concerning model validation -the OR reviewed TWPs (approx. 43 models). Based on the results, it could not be established if the evaluation criteria will result in the development of models with adequate confidence for LA.	OR Report No. OR-03-02	Date Item Closed:
OR Open Item 03-02	During a review of the MII confirmation packages, it was identified that the action statement execution task descriptions and completion schedules for many of the reviewed pkgs., had been modified without appropriate justification. Therefore, pending the resolution of this apparent deviation from a commitment to administer the MII in accordance with the requirements of AP-5.1Q, this issue is identified as this OR Open Item.	OR Report No. OR-03-02	Date Item Closed:
OR Open Item 03-01	This Open Item is based on issues on separate DRs: (1) the effective resolution of concerns related to inadequate personnel training; (2) the failure to establish an effective transition plan; and (3) the evaluation of the SCWE issues.	OR Report No.: OR-03-01	Date Item Closed: **OR Report No.: OR-03-04** **Issue 1 & 2 Closed** **October 20, 2003**

U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report

TABLE 2

OR Open Item 02-13	The current status of corrective & preventive actions associated w/CAR #BSC-02-C-01 revealed that not all corrective actions stated had been complete.	OR Report No: OR-02-05	Date Item Closed: **OR Report No.: OR 03-05** **January 12, 2004**
OR Open Item 02-12	Contrary to requirements of the QARD Supplement III 2.4.C procedure AP-SIII.2Q inappropriately allows for the use of unqualified data - BSCQA procedure change control program failed to identify this issue.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-11	Based on surveillance not identifying specific problems w/Software functionality for codes tested, 7 including NUFT did not pass ITP and/or VTP surveillance.	OR Report No: OR-02-05	Date Item Closed: **OR Report No.: OR-03-06** **Feb 18, 2004**
OR Open Item 02-10	Pending appropriate evaluation & documentation of the design control attributes associated with requirements of 10 CFR 63.44 and Part 21	OR Report No: OR-02-04	Date Item Closed:
OR Open Item 02-09	Pending revision of engineering procedures, to include appropriate design verification considerations.	OR Report No: OR-02-04	Date Item Closed: **OR Report No.: OR-03-06** **Feb 18, 2004**
OR Open Item 02-08	The required performance of annual audits' justification for delaying a scheduled audit of YMSCO for 3-months with an additional extension does not appear to be adequately supported. - Deviation from requirement of Sub-section 18.2.1 E of the QARD.	OR Report No: OR-02-04	Date Item Closed: **OR Report No.: OR-02-06** **January 23, 2003**
OR Open Item 02-07	Model Validation Impact Assessment - addressed the effect of inappropriately validated models on TSPA-SR. Many cases of impact assessments used TSPA-SR results to evaluate the local impacts. It's unclear how this practice evaluated the cumulative impact of all the models in question.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-03-06** **Feb 18, 2004**
OR Open Item 02-06	Unqualified Data Impact Assessment - NRC staff identified unqualified data that could be replaced with qualified data for the performance assessment. For risk-significant components, an evaluation of unqualified data that is replaced with qualified data would help determine if efforts should be undertaken to qualify the removed data.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-05	Provisions are in place that allow for model validation to continue past	OR Report No: OR-02-01	Date Item Closed:

U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report

TABLE 2

	issuance of the documentation. The models used in the performance assessment should have adequate support for their representation at the time the performance assessment documentation is issued.		**OR Report No.: OR-03-06** **Feb 18, 2004**
OR Open Item 02-04	A number of criteria have been developed related to various forms of review. If a review is relied upon for model validation, it should be directed at validating the model and it should encompass the full body of information to the extent practical.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-03-01** **April 14, 2003**
OR Open Item 02-03	More objective criteria (comparison to data not used in the development of the model) typically results in higher confidence in model validation are not distinguished from the more subjective, problematic criteria.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-02	Current process controls specify that one or more of 9 criteria may be utilized to validate a model. All of the criteria should increase confidence in the modeling process, some criteria do not appear to be appropriate for addressing whether the model is valid for its intended use.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-03-01** **April 14, 2003**
OR Open Item 02-01	Failure to properly include the specific issues identified in the Concerns Program Final Report in the resolution process may result in not adequately addressing the original employees concern.	OR Report No: OR-02-01	Date Item Closed: **OR Report No.: OR-02-06** **January 23, 2003**